**I/WE CLAIM:**

1. A method for collecting optical data for use in time resolved optical imaging of an animal, the method comprising:

i) positioning said animal for data acquisition through free-space optics

ii) directionally propagating through free-space optics a pulsed light beam of a selected intensity to illuminate at one or more wavelength a plurality of predetermined illumination points in a region of interest of the animal;

ii) selectively collecting, through free-space optics, light emanating from a plurality of predetermined collection points;

iii) directionally propagating through free-space optics the collected light towards a detector;

iv) measuring, at one or more wavelength, the collected light at the detector to produce a time resolved optical signal for one or more illumination points/collection points configuration; and

wherein light emanating from points other than the predetermined collection points is optically excluded from detection.

2. The method as claimed in claim 1, wherein the time resolved optical imaging is time domain (TD) imaging and wherein the time resolved optical signal is detected such as to generate information related to a temporal point spread function (TPSF).

3. The method as claimed in claim 2, wherein the step of measuring comprises detecting the collected light using time correlated single photon counting approach.

4. The method as claimed in claim 3, wherein each illumination point is illuminated by a plurality of pulses.

5. The method as claimed in claim 4, wherein the step of illuminating comprises adjusting the intensity of the light beam such as to avoid distortions caused by electronics dead-time losses.

6. The method as claimed in claim 5, wherein the intensity is adjusted by varying the source intensity.

7. The method as claimed in claim 6, wherein the intensity is adjusted with filters.

8. The method as claimed in claim 1, wherein the optical signal is detected at two or more wavelengths simultaneously.

9. The method as claimed in claim 1 wherein the optical signal is detected at two or more wavelengths sequentially.

10. The method as claimed in claim 1, wherein the illumination points are illuminated in a raster scan fashion.

11. The method as claimed in claim 1, wherein the collection points are located at a fixed distance from the illumination points to provide optical signal for topographic imaging .

12. The method as claimed in claim 11, wherein the distance is about 3mm.

13. The method as claimed in claim 1, wherein two or more collection points are collected for each illumination point to provide optical data for tomographic imaging.

14. The method as claimed in claim 13, wherein at least two of the 2 or more collection points are collected simultaneously.

15. Th method as claimed in claim 1, wherein detection is effected at a wavelength different from that of illumination.

16. The method as claimed in claim 1, wherein the biological tissue comprises one or more fluorophores and wherein the detection wavelength corresponds to an emission wavelength of the one or more fluorophores and the illumination wavelength corresponds to an excitation wavelength of the one or more fluorophores.

17. The method as claimed in claim 16, wherein both the excitation and emission wavelength are detected.

18. The method as claimed in claim 2, wherein the TPSF is integrated to provide attenuation measurement.

19. The method as claimed in claim 1, wherein optical data from a plurality of regions of interest are collected during a single session.

20. The method as claimed in claim 19, wherein the plurality of regions of interest comprises a whole body of an animal.

21. The method as claimed in claim 1 wherein said animal is controllably heated.

22. A system for collecting optical data for use in time resolved optical imaging of an animal, the system comprising:

i) one or more pulsed light source of selected intensity for providing a light beam at one or more wavelengths;

ii) illuminating optic components for directionally propagating the beam through free space optics such that a region of interest of the biological tissue is illuminated at a plurality of illumination points thereby injecting light into the animal;

iii) collecting optic components for collecting through free space optics light re-emitted at a plurality of predetermined collection points in the region of interest such that light emanating from points other than the

predetermined collection points is optically excluded from detection, and for directionally propagating, through free space optics, the collected light; and

iv) a time domain detector for detecting the collected light.

23. The system as claimed in claim 22, wherein the one or more light sources are variable intensity light sources.

24. The system as claimed in claim 23, wherein the variable intensity light sources are lasers.

25. The system as claimed in claim 24, wherein the illuminating optic components comprise at least one moveable mirror for directing the beam to the plurality of illumination points.

26. The system as claimed in claim 25, wherein the moveable mirror is a mirror galvanometer.

27. The system as claimed in claim 26 further comprising a thin angled mirror located optically downstream of the mirror galvanometer.

28. The system as claimed in claim 27, wherein a lens is positioned between the mirror galvanometer and the thin angled mirror and optically coupled therewith to provide a telecentric imaging configuration.

29. The system as claimed in claim 28, wherein the collecting optic components comprise a lens located above the region of interest and having a focal point coincident with the collection point.

30. The system as claimed in claim 29, wherein the collecting optic components further comprise a mirror galvanometer for directing the collected light to the detector.

31. The system as claimed in claim 30, wherein th mirror galvanometers of the illumination optic and collection optic are synchronized so as to provide a fixed distance between the illumination points and respective detection points.

32. The system as claimed in claim 31, wherein the illumination optics, the detection optics and the source are part of a gantry that can be rotated around the animal.

33. The system as claimed in claim 30, wherein the mirror galvanometers of the illumination optic and collection optic are independently adjustable so as to provide a variable distance between the illumination points and respective detection points.

34. The system as claimed in claim 33, wherein the illumination optics, the detection optics and the source are part of a gantry that can be rotated around the animal.

35. The system as claimed in claim 23, further comprising a translational stage for moving a tray in a plane perpendicular to the illuminating beam wherein the tray is for supporting an animal.

36. The system as claimed in claim 35, wherein the tray is controllably heated to a desired temperature suitable for said animal.

37. The system as claimed in claim 22, wherein the detector is a time correlated single photon counting detector.

38. The system as claimed in claim 22, wherein the detector is a time gated ICCD.

39. The system as claimed in claim 21, wherein the animal, the optical components and the detector are contained in an enclosure.

40. The system as claimed in claim 39, wherein the enclosure is light tight.